

Notice of Allowability

Application No.

10/772,290

Applicant(s)

CHOI ET AL.

Examiner

Art Unit

Thomas H. Parsons

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed 31 July 2007.
2. ☒ The allowed claim(s) is/are 1-3,8-10,13 and 14.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All. b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Response to Amendment

This is in response to the Amendment filed 31 July 2007.

Notice of References Cited

The Notice of References Cited (PTO 892) submitted with the office action mailed 13 December 2006 was not signed and dated by the Examiner. Accordingly, attached herewith is the Notice of References Cited, which the Examiner has signed and dated.

(Previous) DETAILED ACTION

Specification

1. The objection to the disclosure because of minor following informalities has been **withdrawn** in view of Applicants' Amendment.

Claim Rejections - 35 USC § 103

2. The rejections of claims 1-3 under 35 U.S.C. 103(a) as being unpatentable over JP10-302779 (hereafter JP'779) have been **withdrawn** in view of Applicants' Arguments.
3. The rejections of claims 8-10 and 13 under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (5,707,758) in view of JP10-302779 have been **withdrawn** in view of Applicants' Arguments.
4. The rejection of claim 14 under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of JP10-302770 as applied to claim 9 above, and further in view of Parker et al. (6,692,873) has been **withdrawn** in view of Applicants' Arguments.

REASONS FOR ALLOWANCE

5. The following is an examiner's statement of reasons for allowance:

Applicant's arguments, filed 31 July 2007, with respect to claims 1-3, 8-10 and 13-14 have been fully considered and are persuasive. In particular,

The claimed invention relates to a cathode active material comprising a lithium transition metal composite oxide in which a carbon compound is adsorbed to obtain a carbon content of 10-1,000 ppm. JP '799 does not teach or suggest a cathode active material comprising a lithium transition metal composite oxide in which a carbon compound is adsorbed to obtain a carbon content of 10 - 1,000 ppm. The presence of a carbon compound adsorbed to obtain a carbon content of 10 -1,000 ppm cannot be inferred from an alleged similarity of the thermal treatment method described in JP '799 with the described method of preparation of the claimed cathode active material, since the methods are in fact not similar.

In particular, although the claimed invention is not limited to a particular method of preparation, the specification describes that the cathode active material may be prepared by mixing a transition metal compound and a lithium compound in a molar ratio of 1:1.0-1:1.2; and thermally treating the mixture while supplying CO₂ and O₂ in a ratio of partial pressures ranging from 1:0.001-1:1000. It is also described that the thermal treatment may be at a preferred range of between 600 °C and 1000 °C. JP '799, on the other hand, describes that its material is formed by forming and calcining a lithium composite oxide and then, subsequently treating the formed calcined lithium composite oxide with a gas containing CO₂ at a preferred temperature of less than 150 °C.

Therefore, the method described in the specification for forming the claimed cathode active material differs from the method described in JP '799 for forming its material in the following aspects: the content of the gas that is applied (a mixture of CO₂ and O₂ according to the present specification; CO₂ in JP '799), the stage in the formation process in which a gas is applied (during formation of a lithium composite oxide according to the present specification; after a lithium composite oxide has been formed, calcined and allowed to cool in JP '799) and the temperature at which the gas treatment is carried out (preferably 600 °C and 1000 °C according to the present specification; 150 °C or below in JP '799). Therefore, it cannot be inferred from the synthesis method described in JP '799 that its material would meet the limitations of claim material.

In fact, it can be concluded from the different purposes that the gas treatment serves in the cathode active material of the present application and the material of '799 that the two materials would necessarily have to be different. Aspects of the present application are directed to the problem of assuring that a current cut-off device that responds to internal pressure is activated when the battery temperature rises above a normal range. This problem is addressed by providing a cathode active material that has a carbon compound adsorbed thereon at a concentration of 10 -1,000 ppm. When the temperature of the battery rises above the normal range, the adsorbed carbon compound forms gases that raise the internal pressure of the battery, thereby assuring that the cut-off device is activated (see, for example, paragraphs [0020] - [0022] of the present specification). In JP '779, it is described that a CO₂ treatment is applied to "carbonate-ize" lithium hydroxide and lithium oxide that remains after formation of a lithium multiple oxide. It is not described that the resulting products are adsorbed on the cathode active

Art Unit: 1745

material as recited in the present claims. In fact, it is described in JP '779 that its battery is intended for use in hot environments (see, for example, paragraph [0007] of JP '779). Therefore, it would not be desirable in the battery described in JP '779 to have a cathode active material that includes an adsorbed carbon compound, since an undesirable rise in pressure would be generated by gases created by the carbon compound at the intended high operating temperatures of the battery.

Accordingly, it can be concluded that JP '779 does not teach or suggest a cathode active material comprising a lithium transition metal composite oxide in which a carbon compound is adsorbed to obtain a carbon content of 10-1,000 ppm.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


JOSEPH RYAN
PATENT EXAMINER

Thomas H Parsons
Examiner
Art Unit 1745
